

Where does the oil go?

After treatment with SRA

Oil is necessary in a refrigeration unit; it is needed to lubricate the compressor pump. Over time, much of this oil has circulated through the pipes of the refrigeration circuit and clings to inner walls of the pipes that carry the refrigeration liquid or vapour.

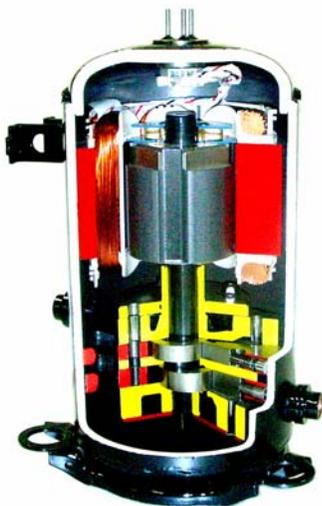
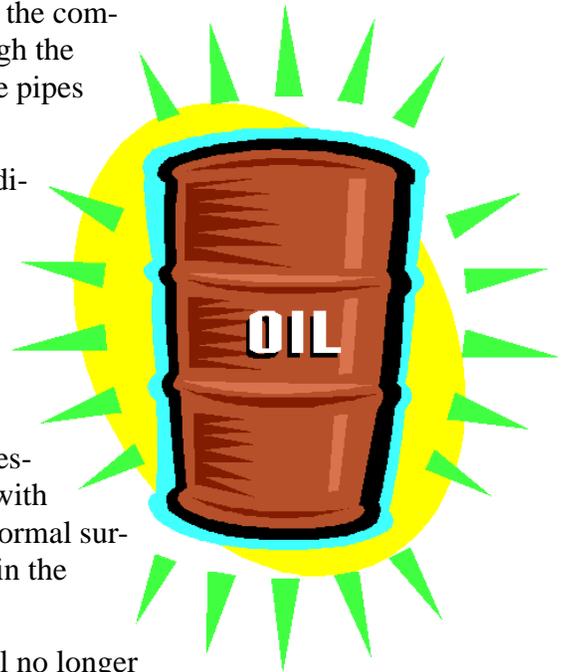
The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) calls the oil that clings to the inside walls of the tubing “oil-fouling” sometimes called a “plaque.” The oil fouling acts as a heat insulator, isolating the refrigeration liquid or vapor from the pipe and hence from the ambient air. This has made the refrigeration system inefficient.

Although the oil fouling sounds bad, it is actually good compressor lubricating oil from the natural circulation of the oil along with the refrigerant. It clings to the refrigerant tubing walls due to normal surface tension attraction. This is still good oil – it happens to be in the wrong place!

The main catalyst in SRA reduces the surface tension so the oil no longer fouls the pipes. As SRA does its job, all this oil slowly is released, and flows back to the oil sump of the compressor. Once there, it is used for lubrication. It continues to circulate through the system as before but it can no longer stick to the tubing to create the heat insulating barrier.

The oil is unchanged and generally is good oil; it is not debris and it is usually not degraded. The refrigeration system is simply returned to its non-oil-fouled state just like it was the day it was manufactured before the oil formed the insulating barrier on the tubing walls.

The refrigerant oil is necessary to lubricate the compressor and it is essential that oil globules reside between the rotating shaft and the bearing – that is where the protection is needed to keeping the parts from bumping together and rubbing metal to metal. However, the oil must not stick to the shaft or the bearing surfaces as there is a shear zone in the oil between the shaft and the bearing where the oil long-chain molecules are literally torn apart. This is why old style “non-detergent” oil in a motor car would turn black after about 1,000 miles of driving; the carbon atoms are torn from



the oil's molecular lattice and turn the oil black. Modern “detergent” oils in a car last 6,000 to 10,000 miles. Detergent is a compound that defeats the surface tension in the oil and prevents it from sticking to shafts, bearings (and tubing walls). The SRA accomplishes this without detergents by using an engineered synthetic catalyst. This actually helps to make the refrigerant oil last longer and the time between periodic replacement of that oil is reduced.



This is an example of the benefits of the Synthetic Refrigerant Additive (SRA) supplied and supported by Power Knot. For more information on the SRA, please contact your local sales representative or send an e-mail to Power Knot at powerknot@powerknot.com.

Power Knot provides safe and economically sound solutions for businesses seeking to reduce energy costs and their carbon footprint through maximizing the efficiency of their cooling systems. Power Knot works with commercial, industrial, and military customers globally to reduce cooling system energy usage, improve energy efficiency, provide colder air, reduce maintenance expenses, and increase the lifetime of the systems. Their technologies are proven and available today, have been in reliable use for many years, and offer a payback period typically of less than two years. For more information, access www.powerknot.com.

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